NEW YORK ENTOMOLOGICAL SOCIETY
92(4), 1984, pp. 405–406

CARRION AS AN ATTRACTANT TO THE AMERICAN DOG TICK, *DERMACENTOR VARIABILIS* (SAY)

The American dog tick, *Dermacentor variabilis* (Say), is a three-host tick with larvae and nymphs that feed on small mammals, and adults that feed and mate on larger ones. Discovery of hosts is usually facilitated by dispersal to areas where the probability of contacting vertebrates is maximized, that is, near runways, trails or roadsides frequented by the appropriate host species. At these places ticks typically climb vegetation where they wait for a host to brush by (Smith et al., 1946; Sonenshine, 1979).

The purpose of this report is to document a newly discovered behavior of *D. variabilis* that could be important in describing its ability to locate large mammalian hosts. The following observations were made while studying the consumption of mouse carrion in a closed-canopy mixed woodland near Chapel Hill, North Carolina, U.S.A. The area has been described earlier by Kneidel (1984).

Six mouse carcasses (*Mus musculus* L.) were exposed in plastic dishes placed 20 m apart along a transect through the woodland on 1 July 1982. The objective of the experiment was to deter colonization by blowflies (Calliphoridae) by covering the openings of the dishes with fiberglass window-screening. Large vertebrate scavengers were also kept from the mice by fixing an additional cover of hardware cloth over the dishes. This extended approximately 12 cm over the dishes and 8 cm around them, and was held in place with three aluminum stakes.

Unlike unprotected carcasses, which are almost completely consumed within 1 week and do not have a strong smell, the protected mice became bloated, decomposed slowly and developed a very strong offensive odor. After 5 days the window-screening over two carcasses was removed, and after 7 days for another. These carcasses still decomposed slowly and retained their strong odor. Although small arthropods fed on the carcasses all were largely intact when collected from the field (after 10 or 11 days) and none were colonized by blowflies.

Two additional carcasses were exposed on 7 July. These had been kept at room temperature indoors for 5 days before being moved to the field and were not covered by window-screening. These also were not colonized by calliphorids, decomposed slowly and had a very strong odor.

On 11 July I noticed adult ticks crawling near some of the carcasses. Subsequently, I carefully inspected each one, including all leaf litter and vegetation over approximately a 0.50 m^2 area around each mouse. I counted 23 non-engorged adult ticks among the eight carcasses (4 had none, 1 had 1, 1 had 4, and 2 had 9).

To determine whether the ticks were actually being attracted by the carrion or whether their presence was independent of it, I also sampled an equivalent area to that surveyed around the mice at eight sites without carcasses on 11 July. These were located at 20 m intervals along a parallel transect, 20 m distant from the one with the mouse carcasses. No ticks were found at any site, so the presence of individuals around the mouse carcasses must be attributed to their attraction to them, and not to chance.

Given the length of time the carcasses had been in the field and the fact that one of the two that had been kept indoors for 5 days yielded nine ticks, it can be concluded further that the attractant must have been the odors of decomposition and not lingering odors of the living mice. Also, the mice were kept frozen before being used in the experiment and had no unusual odor when placed in the field.

A likely explanation for the ticks' movement toward decomposing carcasses is that by being near carrion, discovery and colonization of large mammalian scavengers is facilitated. Interestingly, none of the ticks were found directly on the carcasses. Instead they were climbing about the protective screen of hardware cloth over them. Apparently the ticks climb vegetation surrounding carrion (or in this case hardware cloth) to contact scavengers when they come near.

From 1979 through 1981 I exposed 94 dead mice and cotton rats, but observed only four ticks near one carcass. Their attraction to the eight mice discussed above could be explained by the fact that these carcasses were unique in having such a strong odor. Possibly, larger carcasses are visited more frequently by ticks. This prediction, however, remains to be verified. Most studies of carrion-arthropod associations have dealt primarily with Diptera, Coleoptera, and Hymenoptera, with limited discussion of other taxa. Reed (1958), however, in a thorough survey of the arthropod fauna attracted to dog carrion in Tennessee, reported no ticks visiting the carcasses.—*Kenneth A. Kneidel, Curriculum in Ecology, University of North Carolina, Chapel Hill, North Carolina, USA 27514.*

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